

# TUTORIAL

## Revised Universal Soil Loss Equation (RUSLE)

### A Step-By-Step Walk Through RUSLE version 1.06

## *CLASS EXERCISE*

TYPE	RESULT
rusle, (or click on RUSLE application file)	ENTER executable command to enter RUSLE
ESC	move to program option menu
ENTER	selects option 1, <i>RUSLE Soil Loss Prediction Table</i>
F4	calls R factor program
Down arrow <i>14003</i> , ENTER	to selects City code <i>14003</i> , for <i>Indianapolis, IN</i>
F4	calls LS factor program for field slope
3, ENTER	selects 3 slope segments
ENTER	selects option 1, <i>segments measured down the slope</i>
ENTER	selects <i>segments are varying in length</i>

ENTER	selects soil texture: <i>silt loam</i>
ENTER	selects general land use: <i>1 - regularly tilled cropland</i>
2, ENTER	selects 2% gradient of the 1st slope segment
100, ENTER	selects 100ft length of 1st segment
8, ENTER	selects 8% gradient of slope 2nd segment
75, ENTER	selects 75ft length of 2nd segment
<b>TYPE</b>	<b>RESULT</b>
5, ENTER	selects 5% gradient of 3rd segment
50, ENTER	selects 50ft length of 3rd segment
F3 entire slope length	displays output - LS factor values for slope segments and
ESC (2 times)	returns to R factor program
F3	displays output - R factor value for <i>Indianapolis, IN</i>
ESC (2 times) displayed	returns to RUSLE Main menu, R and LS factor values
ENTER	moves cursor to K factor
F4	calls K factor program

ENTER	selects <i>using Map Unit Interpretation Record/K-nomograph</i> and moves to input screen
ENTER	moves from City code (already loaded) to next input
.17, ENTER	selects K factor value of 0.17
ENTER	selects 0% (default) rock fragments on the soil surface
ENTER	selects “7” (default) years for soil to consolidate
2, ENTER	selects option 2, <i>soil hydrologic group B</i>
<i>Miami</i> , ENTER	selects <i>Miami</i> soil series
5 , ENTER	selects <i>silt loam</i> surface texture
F3	displays output - K factor value
ESC (2 times)	returns to RUSLE Main menu, R, K and LS factor values displayed
TAB	moves cursor to Function (top) line
Down arrow	to selects <i>Save File</i> option
Save file, ENTER	

## TYPE                      RESULT

{*tutorial*},                      ENTER names file *tutorial*

{ *name, info, date* } user records information about file being saved, such as date, user's name, crop productivity, management, planting and harvest date

F3	saves file
TAB, right arrow, down arrow, ENTER	exit RUSLE*
rusle, ENTER (or click on RUSLE application file)	executable command to enter RUSLE*
ESC	move to program option menu*
ENTER	selects option 1, <i>RUSLE Soil Loss Prediction Table</i> *
TAB	moves cursor to Function (top) line*
ENTER	selects option 1, <i>Load file</i> *
Down arrow to into the tutorial, ENTER file	moves cursor to previously saved <i>tutorial</i> file, and loads it  RUSLE Main table. Displays R, K, and LS from saved file
ENTER (3 times)	moves cursor to C factor on Main table
F4	calls C factor program
ENTER	selects <i>Time Varying Scenario</i>
ENTER	selects City code <i>14003</i> , (already loaded)
ENTER	selects <i>do not adjust for moisture depletion</i>

ENTER selects 0% rock fragments on surface

ENTER selects *1* - *calc. value from soil, slope, & cover*

*\* purpose of these keystrokes and steps is to demonstrate the “save” and “load” functions*

## TYPE RESULT

ENTER selects *regularly tilled cropland*

1, ENTER selects *one* year in the crop rotation

Down arrow  
*corn* , ENTER to selects *corn*; *125 bu* as the crop

F3 (2 times) moves cursor to next input screen

ENTER moves cursor to next input

ENTER selects option 1, *no senescence effect*

4/15/1 , ENTER enters date of first field operation

down arrow to selects *chisel plow st. pts* as first field operation  
*chisel*, ENTER (2 times)

4/25/1 , ENTER enters date of second operation

down arrow to selects *harrow* as second field operation

*harrow* , ENTER (2 times)

*5/1/1* , ENTER enters date of third operation

down arrow to selects *conv. row planter* as third field operation  
*conv. planter* , ENTER (2 times)

*10/15/1* , ENTER enters date of fourth operation

down arrow to selects *harvest* as fourth field operation  
*harvest* , ENTER

ENTER displays residue (#/ac) added at harvest and % residue cover

F3 moves to C factor output screen

ENTER selects option 1, *Rotational C factor output*

ESC returns to output option screen

2, ENTER selects Option 2, *Operational C factor output*

**TYPE** **RESULT**

ESC returns to output option screen

3, ENTER selects option 3, *half-month subfactor values displayed*

ESC returns to output option screen

TAB moves cursor to Function line

2, ENTER selects option 2, *Save file*

ENTER	selects <i>tutorial</i> file name
F3	saves contents of file
ESC	returns through previous screens to RUSLE Main table. R, K, LS, and C factor values are displayed
ENTER	moves cursor to P factor on Main table
F4	calls P factor program
ENTER	selects <i>calculate frequent-disturbance P factor</i>
F4	calls Contour P factor option
ENTER	selects City code <i>14003</i> , entered previously
4, ENTER	selects <i>moderate (3"-4") ridges</i>
1, ENTER	selects furrow (row) grade of 1%
ENTER LS	selects equivalent slope that was previously calculated in program
ENTER factor	selects <i>soil hydrologic class 2</i> , entered previously in K program
6, ENTER <i>minimum</i> <i>roughness</i>	selects Cover/Roughness code 6, <i>no cover and/or</i>

2, ENTER selects *have veg. strips along with contouring*

## TYPE

## RESULT

F3 displays contour P subfactor value

ESC (2 times)  
appears returns to P Factor Main table. Value for contouring appears

ENTER moves cursor to *perm. barriers or strips*

F4 calls *strips* P Factor option

ENTER selects soil texture: *silt loam*

1, ENTER selects *1* year

2, ENTER selects code to *enter strip widths in feet*

2, ENTER selects *2 strips on hillslope*

ENTER selects code *6 - no cover and/or min. rough.*

200, ENTER selects width of first strip, 200 feet

ENTER selects 5.5 (default) steepness of first strip

1, ENTER selects code *1 - established grass*

25, ENTER selects width of grass strip at base of hillslope

F3 displays strip P factor and sediment delivery ratio outputs

ESC (2 times)	displays P factor outputs
ESC (2 times)	returns to RUSLE Main table. Values appear for all factors,
	for soil loss (A), and sediment yield (SY)
TAB	moves cursor to Function line
2, ENTER	selects option 2, <i>Save file</i>
ENTER	selects <i>tutorial</i> file name
F3	saves contents of file
TAB	moves cursor to Function line
<b>TYPE</b>	<b>RESULT</b>
right arrow,	then exit RUSLE
down arrow, ENTER	

## QUESTIONS FROM TUTORIAL (Answers Below)

1. How did the R factor appear on the screen? Did you enter that value?
2. What is the LS value for this irregular slope?

What is the LS value for the 1st slope segment?

What is the LS value for the 2nd slope segment?

What is the LS value for the 3rd slope segment?

On which slope segment would you expect erosion to be greatest?

3. (use C factor output option 3 (half-month subfactor values) to answer the following:

What is the residue cover after harvest? (%)

What is the residue cover before the next tillage operation? (%)

Explain this difference in % cover?

What is the residue cover after planting? (%)

4. What is the soil loss (A) on this slope? (tons/acre/year)

What is the sediment yield (SY) at the base of this slope?

Do you think this rate of soil loss is acceptable, or tolerable?

Do you think there are water quality concerns at the base of this slope?

5. What could be done to reduce soil loss on this slope?

6. What factor values would change if you used RUSLE to estimate erosion with the practices mentioned in 5, above?

## (Answers)

1. The R factor was loaded automatically from the City database.

2. 0.961

0.265

1.754

1.165

2nd Segment

3. 94%

84%

Residues have decomposed

44%

4. 0.74 tons/acre/year

0.07 tons/acre/year

Yes

No

5. Eliminate tillage operations that bury surface residue, add grass strip near middle of slope, install terrace.

6. The C factor (reduce tillage) and P factor (grass strip, terrace)